

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-54 (cancelled)

55. (New) An illumination apparatus provided in an exposure apparatus which exposes an object with an illumination beam via a mask to illuminate with the illumination beam an area on a predetermined plane on which a pattern surface of the mask is placed, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes, that includes a plurality of optical members arranged along an optical axis substantially perpendicular to the predetermined plane of which the area is illuminated via the plurality of optical members with the illumination beam having any one of plural intensity distributions different from each other on a pupil plane of the illumination optical system; and

a shaping optical system provided on the optical path in the illumination optical system to shape the plural intensity distributions of which one has an increased intensity portion

apart from the optical axis relative to a portion of the one intensity distribution on the optical axis, that includes prisms provided on the optical axis, of which at least one is movable in a direction along the optical axis and between which an interval in the direction is variable by the at least one prism to change the one intensity distribution.

56. (New) An apparatus according to claim 55, wherein at least one of a position, relative to said optical axis, and a size of the increased intensity portion of said one intensity distribution is variable.

57. (New) An apparatus according to claim 55, wherein said shaping optical system includes zoom lenses on said optical axis relatively movable in said direction along the optical axis to change at least a size of the increased intensity portion of said one intensity distribution.

58. (New) An apparatus according to claim 57, wherein said shaping optical system changes at least one of a position and a size of said increased intensity portion by at least one of said prisms and said zoom lenses.

59. (New) An apparatus according to claim 55, wherein said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal.

60. (New) An apparatus according to claim 59, wherein each of said increased intensity portions is variable in orthogonal first and second directions on said pupil plane by said prisms.

61. (New) An apparatus according to claim 59, wherein said shaping optical system includes zoom lenses on said optical axis relatively movable in said direction along the optical axis, and changes at least one of positions and sizes of said increased intensity portions by at least one of said prisms and the zoom lenses.

62. (New) An apparatus according to claim 55, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

63. (New) An apparatus according to claim 55, wherein said one intensity distribution is shaped in an off-axis illumination mode that includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal.

64. (New) An apparatus according to claim 63, wherein each of said increased intensity portions is variable in orthogonal first and second directions on said pupil plane by said prisms.

65. (New) An apparatus according to claim 63, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has two increased intensity portions and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has

four increased intensity portions.

66. (New) An apparatus according to claim 65, wherein said two increased intensity portions in said dipole mode are respectively arranged at positions, on said pupil plane, of which distances from said optical axis with respect to said one direction are substantially equal.

67. (New) An apparatus according to claim 65, wherein said four increased intensity portions in said quadrupole mode are respectively arranged at positions, on said pupil plane, of which first distances from said optical axis with respect to one of said two different directions are substantially equal and of which second distances from said optical axis with respect to another of said two different directions are substantially equal.

68. (New) An apparatus according to claim 63, wherein said increased intensity portions are defined so that an optical gravity center of said one intensity distribution is substantially coincident with said optical axis.

69. (New) An apparatus according to claim 63, wherein said increased intensity portions are defined so that an incident angle of the illumination beam from each one of said increased intensity portions satisfies the following relation:

$$\sin \phi = \lambda / 2P$$

where ϕ is the incident angle, λ is a wavelength of the illumination beam, and P is a pitch of a pattern on said mask.

70. (New) An apparatus according to claim 63, wherein said increased intensity portions are disposed on a pair of first line segments substantially parallel to a first direction perpendicular to a second direction in which features of a pattern on said mask are periodically arranged, the pair of first line segments being defined apart from said optical axis by a first distance in the second direction.

71. (New) An apparatus according to claim 70, wherein said increased intensity portions are disposed on said pair of first line segments and a pair of second line segments substantially parallel to said second direction, the pair of second line segments being defined apart from said optical axis by a second distance in said first direction.

72. (New) An apparatus according to claim 71, wherein said increased intensity portions are disposed on crossing points of said pair of first line segments and said pair of second line segments.